From CAMPUS TUG-OF-WAR

to PULLING together

Using the *Lean* Approach

By
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SOME DAYS SEEM LIKE BOUTS IN AN ENDLESS GAME OF TUG-OF-WAR. At one end of the rope, facilities professionals must do more — tackle deferred maintenance, develop a climate strategy, and meet the energy and operational needs for a complex mix of building types and stakeholders. Tugging on the other end are the obstacles of less money, staff, and support. Many of us are faced with accomplishing more with fewer resources, all while managing stakeholders with competing interests.

Consider the story of Charles, who had to reduce energy costs with a vanishing capital budget.

Problems – Charles, an engineer, maintained an industrial campus with 300+ aging buildings. Coming from the latest budget cut meeting, he wondered how he could reduce energy costs when his capital allowance had almost vanished. His boss' demands were clear: find a way to get rid of one of the power plants, stop capital spending, reduce energy costs by 10 percent and reduce greenhouse gas emissions without spending a lot on building improvements. He knew that some manufacturers had experienced recent dramatic improvements by applying something called "*lean*." So, he phoned Glen, one of the company's internal *lean* advisors to find out what *lean* was about.

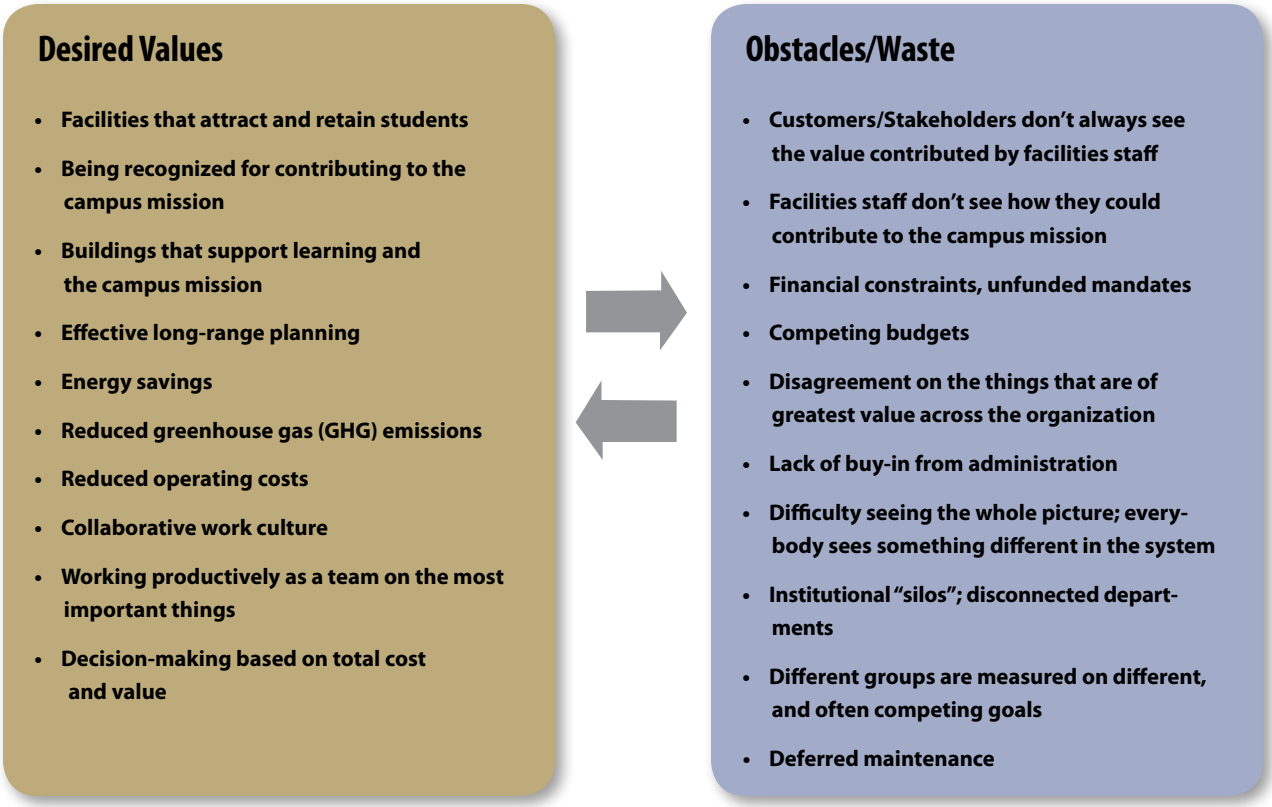
At the same time, Charles pursued a standard approach to finding cost savings. He had his staff look for outside energy consultants who could provide solutions.

A *Lean* Approach – Charles was surprised when Glen suggested that they avoid jumping to "solutions" by hiring consultants. He believed Charles' own staff could do most of the work. Following Glen's advice, Charles assembled people from across the campus and took time to understand energy generation and consumption as a "system." They came to understand that the most important value arising from energy was to maintain manufactured product quality and worker comfort. They also identified key problems and wastes across the site. To Charles, this uncovering of new problems actually made things look worse!

Glen helped him to use these problems to his advantage by forming internal teams to conduct a series of rapid improvement workshops, known as *kaizens*. Using their initial findings to guide them, each team strengthened their understanding of the problems by going to see how the energy was used (or wasted). They examined what was important to keep in order to maintain product quality and worker comfort and considered solutions that would get rid of waste. Teams identified many demand-side savings, such as reducing building air flow and implementing more effective time of day schedules. Other teams worked the generation side, identifying ways to improve steam performance and to reduce parasitic loads (air conditioning an area that simultaneously uses process steam heat). Over two years these teams met regularly and relentlessly studied problems, prioritized savings opportunities, and quickly implemented the lowest-cost, highest-value changes.

Outcomes - The outcomes were surprising – $27 million in annual energy savings, a 12 percent reduction in greenhouse gases in one year, and a 16 percent the following year.

A better approach gave them better results. *Lean* is increasingly being applied to tackle non-manufacturing problems, like those of the facilities professional. As stewards of the campus built environment, the role of a facilities professional has never been more important or challenging than in today's economic conditions. Similar to the manufacturer's energy conundrum, obstacles get in the way of delivering desired value. You might recognize some of the forces at play in the tug-of-war on your own campus.



The value and obstacles on campus may change over time, but the effects remain – frustrated facilities staff, suboptimal decision making, lack of buy-in, and competing priorities.

This article is an introduction to *lean*, an approach that can help you to understand what your customers value, reach consensus on what's most important, work with others to get obstacles out of the way, and get more of the right things done.

Applying *lean* to address those problems can yield surprising benefits.

Lean:

- Offers a means to engage key stakeholders across the campus
- Builds a *shared* understanding of desired outcomes and helps people focus on the right things
- Helps people see system wastes and costs
- Uses an internal team to develop ideas and solutions
- Reduces waste and creates more customer value
- Creates more meaningful work for staff
- Breaks down departmental silos
- Applies "learning by doing" to enable people to work together more productively

Why are results from using a *lean* approach so different? *Lean* is a value-focused approach that prioritizes customer value and respect for workers, while reducing system wastes and costs and removing obstacles to stakeholder value. It emerged from the manufacturing world and is now helping organizations as diverse as education and healthcare institutions, consumer products companies, and the real estate and construction industries to increase delivered value.

In order to understand some of the fundamentals of *lean*, it might be useful to consider who a facilities professional's customers and stakeholders might be. Facilities professionals serve many kinds of customers. There may be customers within your own department, such as the utilities manager, who serves an individual building manager. Other customers may be the campus sustainability coordinator or the institution's administration. Your customers may also be the end-users of your buildings and services, such as students and faculty. Your stakeholders are equally diverse and may include employees, partners, alumni, donors, the trustees, and the community, as well as your customers. *Lean* will help you to understand what your stakeholders value and deliver that value in the least-waste way.

LEAN FUNDAMENTALS

Two of *lean*'s basic principles are integral to Glen's situation and can be applied to campus operations.

1. Understanding **value vs. waste**. Knowing who your customers are and what they value helps you see what parts of your process delivers that value. A deep understanding of value can guide your decisions.

2. Recognize the **value stream** – the entire system. Consider *all* of the activities, materials, information, problems, equipment, and people in the system involved in providing what your customers want. Facilities professionals are responsible for significant projects, and must rely on the participation of people and resources in that system they don't directly manage. A group of stakeholders working together can create a map of the value stream that helps them discover why things are done, what's really important, who can best contribute and what gets in the way. Creating the value stream map is a useful technique for breaking down mental barriers between departments, identifying waste, and serves as a foundation for improving a process together.

On the next page is a value stream map that depicts paper use and waste at a college that applied *lean* principles; the team reduced paper use by over 20 percent and simultaneously created more value for campus stakeholders.

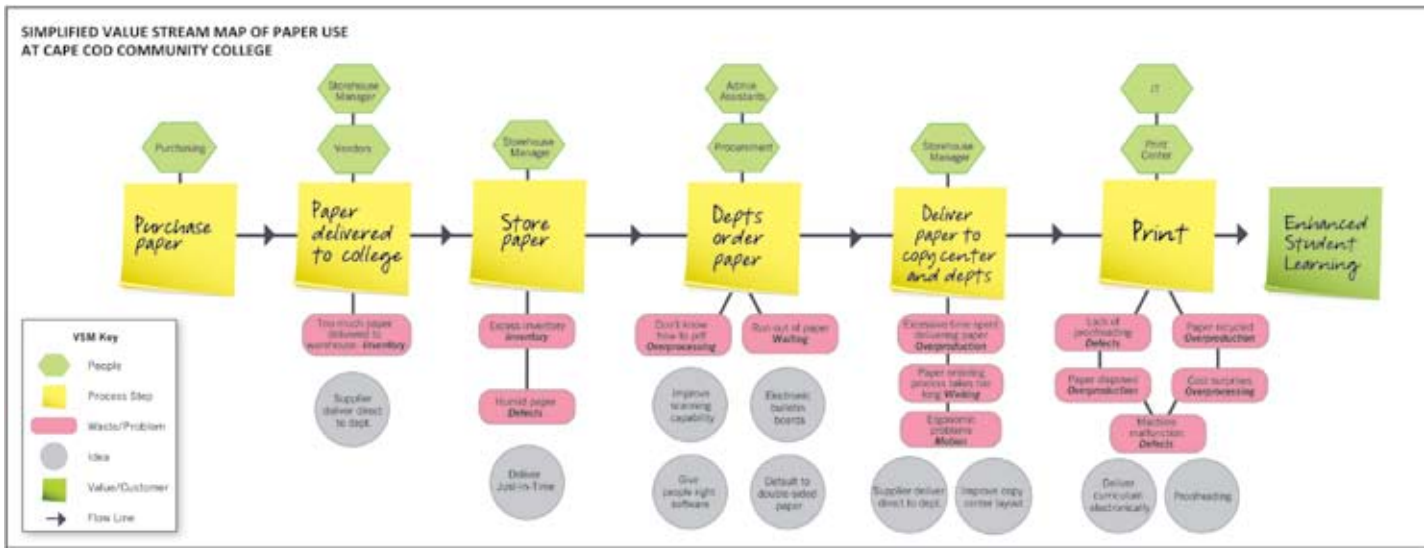
The other fundamental principles of *flow*, *pull*, and *perfection* are equally useful: however this article focuses on the first two.

By using *lean* principles, and understanding where waste comes from, facilities professionals can take a holistic approach to identifying value, removing waste, and building value within

Look for these types of wastes on your campus:

- **1. Transportation:** when information, materials, or equipment are physically moved without adding value in the eyes of the customer (i.e., moving and delivering supplies and mail from one end of campus to another).
- **2. Inventory:** A buildup of information, materials, or equipment the customer (or next process) is not ready for (i.e., unused space).
- **3. Motion:** Movement (of a person) that consumes time and energy while adding no customer value, (i.e., walking across campus when equipment you need isn't in the truck).
- **4. Waiting:** Resources (people, machines) capable of adding value are waiting but not contributing to creating customer value (i.e., construction scheduling delays).
- **5. Overproduction:** Making more information, services, or products than demanded by the customer (i.e., delivering more heat than is needed by building occupants).
- **6. Overprocessing:** Doing more than is necessary to provide the customer with what they need (i.e., discussing the same thing over and over again, without reaching a decision).
- **7. Defects:** Items, information, or services that don't meet customer specifications and require scrapping, repair, or rework (i.e., poorly maintained temperature control valves in buildings).

Value Stream Map Example



departments and across campus. Imagine if everyone in the value stream (facilities, administration, students, and faculty) understood how the process *really* looked.

The following example describes how a major university recently applied *lean*:

Disclaimer: *names have been changed to protect the successful.*

Problems – Matt, a project manager for climate action planning, was charged with motivating seven workgroups to generate ideas for carbon emissions reductions across campus in support of a climate action plan that was to go before the Sustainability Steering Committee. These ideas also had to reduce costs and contribute to the mission of the university. Some of the teams were also faced with hidden wastes and costs, a lack of understanding about the processes that were creating carbon emissions. They were more concerned with meeting existing departmental goals and challenges rather than spending time on a seemingly unrelated sustainability project. After all, what did *they* have to do with the American College & University Presidents Climate Commitment?

Their standard approach would have involved countless meetings with smaller sub-groups, each trying to determine which ideas would generate energy savings and reduce greenhouse gas emissions, all without knowing which ideas would have buy-in from stakeholders. They also lacked the knowledge of how their ideas would impact parallel values and obstacles working within the campus system.

A *Lean* Approach – Matt assembled two cross-functional teams for a rapid improvement workshop (*kaizen*) that included representatives from administration, facilities, IT, energy services, and students; he used *lean* facilitators for guidance. Before the team talked about carbon emissions, they discussed what shared goals they wished to accomplish that would be supportive of their *existing* department goals and that would address existing challenges. Several team members were skeptical about this application of *lean*; after all, "Isn't this process just for manufacturing?" However, the team did agree on some metrics for the improvement project that included:

- Decrease carbon while being cost-neutral or generating cost-savings
- Enhance education and awareness of environmental impacts on campus
- Contribute to existing department goals
- Strengthen partnerships with suppliers and vendors

The groups decided that examining IT use (including computers and servers) and paper use would be tangible processes where they could achieve these metrics. Together, the teams created visual maps of both IT and paper processes that showed

Lean Facts vs. Fiction

***Lean* is not an acronym**

***Lean* is not just a set of tools, it is a system that includes principles, ways of thinking, and tools.**

***Lean* is not contrary to Six Sigma and ISO frameworks, they can provide tools which are easily used in Lean.**

***Lean* is not another, separate initiative, or contrary to existing goals – it's an approach that improves the things we already do**

***Lean* is not job cutting – while sometimes thought of as a necessary measure, cutting jobs is not consistent with the concept of respect for people and is therefore not the same as lean.**

the realistic flow of material, information, people, value, and waste in the systems (otherwise known as *value stream maps*).

By seeing and mapping the processes, they uncovered many hidden problems such as underutilized servers; non-standard purchasing processes; too many operating systems and software; environmental information not built into purchasing decisions; unfamiliarity with electronic means of delivering educational materials; 4.5 tons of catalogs sent to the university every week. In all, the teams uncovered 87 problems and wastes in their systems.

They collaborated to brainstorm ideas for reducing waste and cost and generating more value to campus stakeholders. A detailed Impact/Difficulty analysis helped them to prioritize the ideas, identify obstacles to implementation, and find resources and people and who could help with implementation.

Outcomes – The teams and individual departments delivered great value to the university that was visible and recognized. Their results, generated in just two days, included:

- 95 ideas prioritized for their ability to reduce GHG, wastes, and problems
- Several ideas for saving money and contributing to the university's mission that could be implemented in less than one year
- Ideas that contributed to departmental goals and addressed systemic problems
- New cross-departmental/campus connections and improved working relationships
- Increased staff and student awareness of processes (seeing what *actually* happens)
- Project manager equipped to use *lean* approach with other workgroups

TOGETHER, THE TEAMS CREATED VISUAL MAPS OF BOTH IT AND PAPER PROCESSES THAT SHOWED THE REALISTIC FLOW OF MATERIAL, INFORMATION, PEOPLE, VALUE, AND WASTE IN THE SYSTEMS.

Imagine yourself in one of Glen's or Matt's organizations. You would be involved in teams that need to make improvements with people who don't always get along or normally work together. As you applied *lean* thinking, people with competing priorities would find common threads, customers would be satisfied, value would increase, and the organization would be able to avoid unnecessary costs.

So what steps would you go through to apply *lean*?

1. Get help from someone with *lean* experience. This person will help you understand value, and how *lean* principles and tools will apply.
2. Focus on value – clarify who your customer is and what's important to them (value).
3. Identify problems in delivering that value.
4. Get management support. Identify the key sponsors/champions of this improvement effort. They can help ensure you're working on the right things.
5. Get a diverse group involved – identify and reach out to your stakeholders. Ask if they see the problem in the same way. You'll likely find there's a lot you don't know. Ask the group for their help in finding improvements.
6. Consider the value stream together – go and see what actually happens in a process. Try to create a simple map of the process you're considering.
7. Don't jump to solutions - instead, examine the value stream together. Evaluate the contribution of every part of the process to identify problems and ideas to improve.
8. Prioritize the ideas and select the best ones to implement quickly.
9. Standardize – make the new approach standard. When you implement the new process, you'll often find more problems. Don't give up. Improve the new process, too!
10. Share success, recognize and celebrate - with *lean*, the ideas and solutions to the problems should make things better for your customers and your team. Take the opportunity to celebrate the success and things you've learned together!

As a facility professional, you're ideally positioned to discover the same ways of collaborating and bringing clarity to your challenges. It's often been said that *lean* is a journey. By reading this article you've started your own journey. We wish you well and hope you continue with great success.

To learn more about applying *lean* thinking, here are some resources we recommend:

The Toyota Way by Jeffrey Liker (McGraw-Hill, 2003)

Lean Thinking: Banish Waste and Create Wealth in Your Corporation by James Womack and Daniel Jones (Free Press, 2003)

Lean for Dummies by Natalie Sayer and Bruce Williams (For Dummies, 2007)

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